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METHOD FOR DETERMINING THE WATER REPELLENCY OF FABRICS BY WATER SPRAY TEST

(First Revision)

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METHOD FOR DETERMINING THE WATER REPELLENCY OF FABRICS BY WATER SPRAY TEST
(*First Revision*)

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Indian Standard

METHOD FOR DETERMINING THE WATER REPELLENCY OF FABRICS BY WATER SPRAY TEST

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 7 July 1975, after the draft finalized by the Chemical Methods of Test Sectional Committee had been approved by the Textile Division Council.

0.2 This standard was first published in 1952 and has been revised to make it up-to-date.

0.3 Water passes through water-resistant fabrics by: (a) penetration of water through their interstices under its own or applied pressure (the resistance offered by fabrics to this action is influenced mainly by their construction or structure); (b) wetting of one side of the fabrics followed by capillary action, this brings the water to the other side and wets it (the resistance offered by fabrics to this action is influenced mainly by their water-repellency); or (c) a combination of (a) and (b).

0.4 A number of test methods has been developed for testing waterproofness, water repellency and water resistance of fabrics like spray test, hydrostatic head test, Bundesmann test and cone test. However, the use of a particular test depends upon the type of fabric under test and its end use. So far no correlation has been established between the results of different test methods and hence their results are not comparable.

0.5 The spray test prescribed in this standard is a fairly simple test for assessing the resistance of fabrics to wetting by water (water repellency). According to this standard the water repellency of fabrics is assessed on the basis of the area of the specimen wetted by a spray of water.

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1. SCOPE

1.1 This standard prescribes a method for determining the water repellency of fabrics (permeable as well as non-permeable to air) on the basis of the wetted area of the specimen by spray test.

2. SAMPLING

2.1 Samples drawn in compliance with the procedure laid down in the material specification or as agreed to between the buyer and the seller shall be taken as representative of the lot. In case of cotton fabrics reference to IS : 3919-1966* shall be made.

2.2 At least four test specimens, each 230 mm in diameter, shall be drawn at random from each individual piece in the test sample.

3. CONDITIONING AND TESTING ATMOSPHERE

3.1 The test specimen shall be conditioned in accordance with IS : 6359-1971† except in case of fabrics heavier than 270 g/m^2 for which the minimum conditioning period shall be 48 hours.

3.2 The tests shall be preferably carried out in standard atmosphere (*see* IS : 196-1966‡). In case it is not possible to carry out the test in standard atmosphere, the specimens shall be conditioned as provided for in **3.1** and tested in prevailing atmosphere immediately thereafter.

4. APPARATUS

4.1 For the purpose of this test, the following apparatus shall be assembled as given in Fig. 1.

4.1.1 *A Spray Device* — It shall be so constructed that 250 ml of water should take 25 to 30 seconds to spray on the specimen and the spray should cover an area approximately 150 mm in diameter in a horizontal plane 150 mm below the perforated spray nozzle.

4.1.2 *Stand* — For holding spray device and the specimen holder. The specimen shall be at an angle of 45° to the vertical central line of the funnel and the spray device shall also be vertical.

4.1.3 *Specimen Holder* — a thin circular frame of 150 mm inside diameter closely fitting in an outer circular frame (similar in construction to hoops used for embroidery).

5. PROCEDURE

5.1 Mount the specimen in the specimen holder, face upward, taking care to keep the former taut. Place the specimen so mounted under the spray nozzle on the support provided in the stand for this purpose in such a way that the warp threads are approximately parallel to the direction of flow of water. Pour from the sides quickly into the funnel 250 ml of distilled water at 27 ± 2°C and allow it to spray on the specimen. (In order to make the degree of wetting distinctly visible, such colouring matter may be added to water, that does not affect the surface tension of water.)

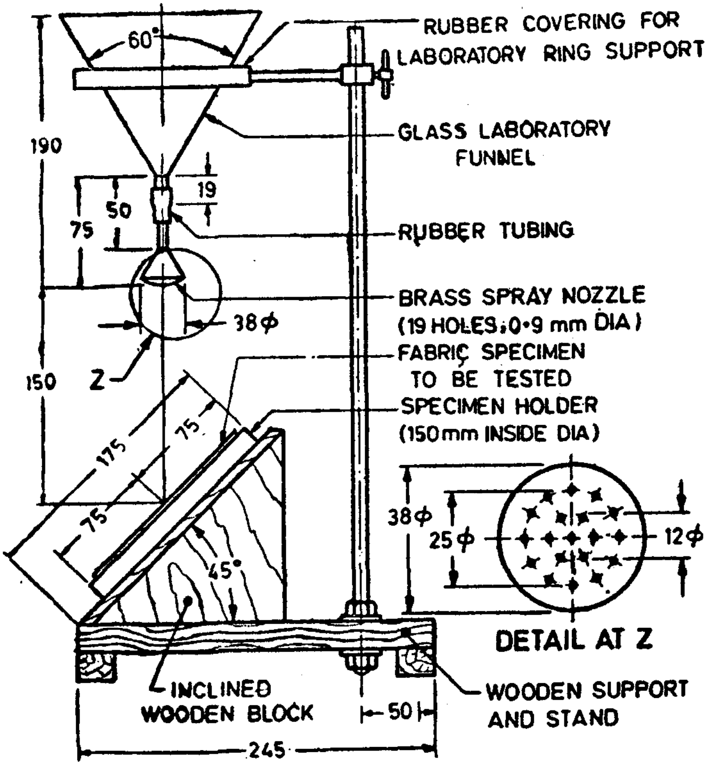
---

*Methods for sampling cotton fabrics for determination of physical characteristics.

†Method for conditioning of textiles.

‡Atmospheric conditions for testing (*revised*).

NOTE — Where it is not possible to distinguish between the ' face ' and the ' back ', the surface of the specimen mounted upwards shall be held to be its face.


RUBBER COVERING FOR LABORATORY RING SUPPORT
60°
190
GLASS LABORATORY FUNNEL
19
50
75
RUBBER TUBING
BRASS SPRAY NOZZLE (19 HOLES; 0·9 mm DIA)
38ϕ
Z
150
FABRIC SPECIMEN TO BE TESTED
SPECIMEN HOLDER (150 mm INSIDE DIA)
175
75
75
45°
38ϕ
25ϕ
12ϕ
DETAIL AT Z
INCLINED WOODEN BLOCK
50
245
WOODEN SUPPORT AND STAND

All dimensions in millimetres.

FIG. 1 APPARATUS FOR SPRAY TEST

5.2 Remove the specimen holder from the stand when the spraying has ceased. Hold the specimen holder so that, the lowest point of the holder during spraying is in the lowest position, the holder is slightly inclined to the vertical, and the face of the specimen leans slightly forward. Tap the lowest point of the holder 3 times in succession against a horizontal surface.

6. METHOD OF RATING

6.1 Immediately after the tappings compare, under reflected light, the wetting of the face of the specimen with the photographic standard spray test ratings (*see* Fig. 2). Assign the specimen under test the standard spray test rating to which its wetting best approximates.

6.2 Repeat the test with the remaining test specimens and rate them.

6.3 The average standard rating number obtained by evaluating all the test specimens, rounded off to the nearest standard rating numbers, shall be reported as the rating number of the sample.

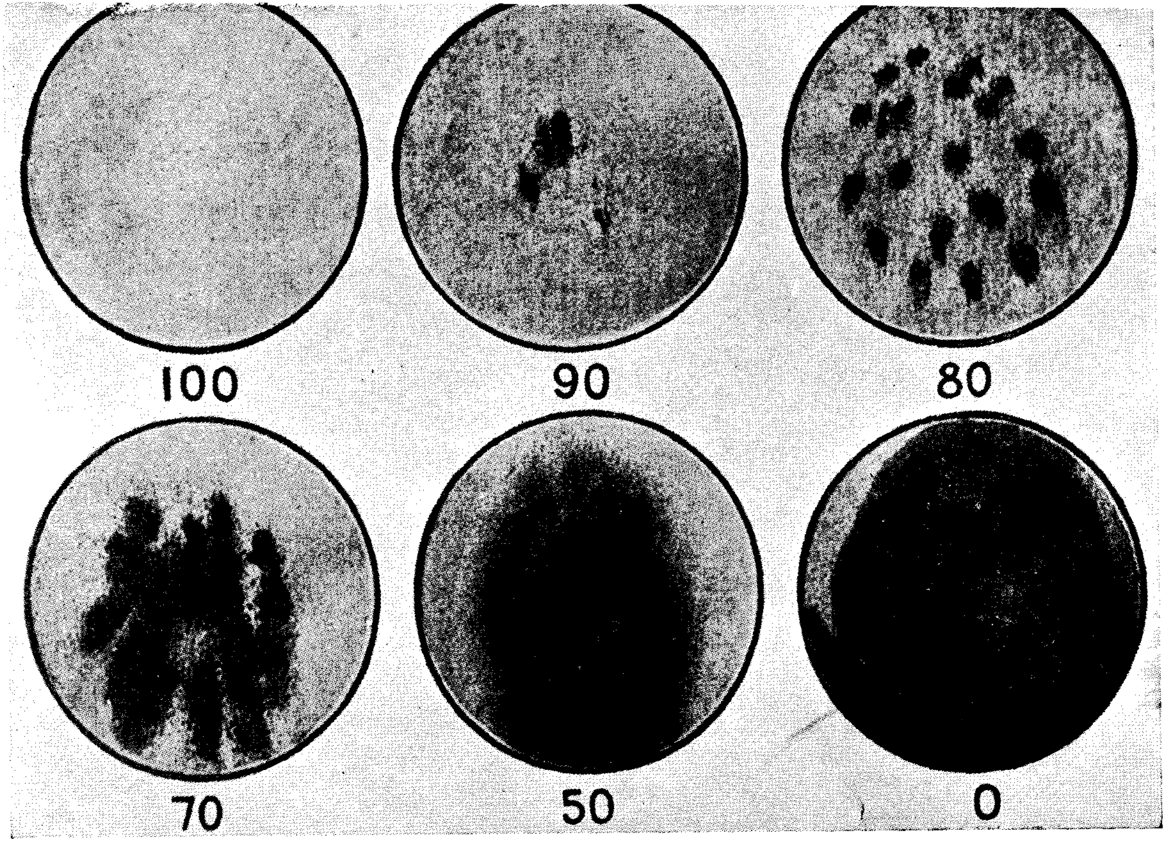
7. REPORT

7.1 Report shall include the following information:

a) Type of fabric,

b) Number of test specimens tested, and

c) Rating number.



100 — No sticking or wetting of the face
90 — Slight random sticking or wetting of the face
80 — Wetting of the face at spray points
70 — Partial wetting of the whole of the face
50 — Practically complete wetting of the whole of the face
0 — Complete wetting of the whole of the face

Coloured water used for photographic effect

Fig. 2 Standard Spray Test Ratings

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

Quantity	*Unit*	*Symbol*
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

Quantity	*Unit*	*Symbol*
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

Quantity	*Unit*	*Symbol*	*Conversion*
Force	newton	N	$1\ \mathrm{N} = 1\ \mathrm{kg}.1\ \mathrm{m/s^2}$
Energy	joule	J	$1\ \mathrm{J} = 1\ \mathrm{N.m}$
Power	watt	W	$1\ \mathrm{W} = 1\ \mathrm{J/s}$
Flux	weber	Wb	$1\ \mathrm{Wb} = 1\ \mathrm{V.s}$
Flux density	tesla	T	$1\ \mathrm{T} = 1\ \mathrm{Wb/m^2}$
Frequency	hertz	Hz	$1\ \mathrm{Hz} = 1\ \mathrm{c/s}\ (\mathrm{s^{-1}})$
Electric conductance	siemens	S	$1\ \mathrm{S} = 1\ \mathrm{A/V}$
Pressure, stress	pascal	Pa	$1\ \mathrm{Pa} = 1\ \mathrm{N/m^2}$

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